Trend Study 17-40-02

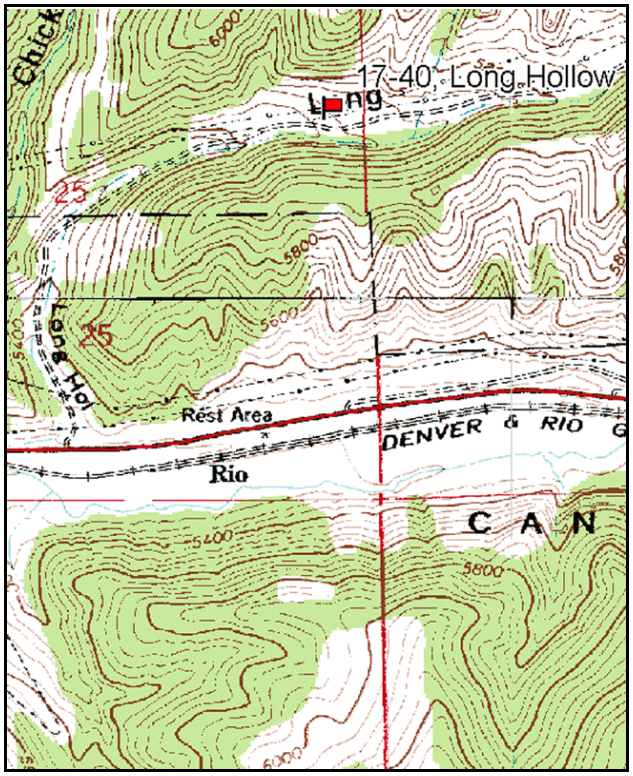
Study site name: Long Hollow . Vegetation type: Big Sagebrush-Grass .

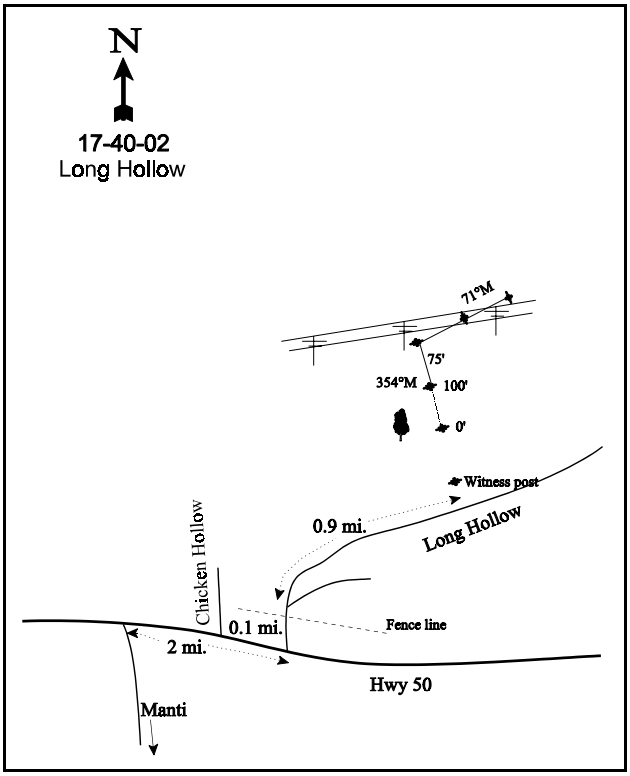
Compass bearing: frequency baseline 354 degrees magnetic (line 3-4 @ 71°M).

Frequency belt placement: line 1 (11 & 95 ft), line 2 (34 ft), line 3 (59 ft), line 4 (71 ft). Rebar: belt 2 on 1ft.

LOCATION DESCRIPTION

Beginning at the intersection of Highway 50 and Long Hollow Road, proceed northerly up Long Hollow for 0.10 miles to a fork. At the fork, stay to the left and proceed an additional 0.90 miles up Long Hollow, to a green steel "T" fencepost on the left side of the road. From the stake, the 0-foot marker of the baseline is 15 feet to the north, near a juniper. The study is marked by green steel "T" fenceposts approximately 12 to 18 inches in height. A red browse tag, number 3946, is attached to the 0-foot baseline stake. High tension power lines run above the study site.





Map Name: Billies Mountain

Diagrammatic Sketch

Township 9S , Range 5E , Section 25

GPS: NAD 27, UTM 12S 4428135 N 436904 E

DISCUSSION

Long Hollow - Trend Study No. 17-40

This trend study samples critical deer and elk winter range located in Long Hollow, a narrow canyon draining directly into the Spanish Fork River. The study is located close to the valley floor on a gentle (5-10%) south slope at an elevation of 5,760 feet. The transect samples a sagebrush-grass community that has been impacted by activities associated with power line construction. Animal use was initially determined as being heavy by deer and elk. Cattle and sheep use was reported moderate in the past, but there was no evidence of use by either in 1997. Long Hollow is obviously an important wintering area for big game as evidenced by the number of pellet groups. Pellet group quadrat frequency was high for elk (63%) and moderate for deer (32%) in 1997. Quadrat frequency of deer pellet groups was more abundant in 2002 at 51%, while elk was only 15%. Three winter-killed deer were found on the site in 1983. Data from a pellet group transect read along the study baseline in 2002 estimated 87 deer and 23 elk days use/acre (215 ddu/ha and 58 edu/ha). Cattle use was estimated at 10 days use/acre (25 cdu/ha) in 2002. Most wildlife use was from winter and early spring, while cattle use was from the summer of 2001.

Soil is alluvially and colluvially deposited from the surrounding "North Horn" formation, a coarse and well-drained conglomerate. Numerous variable sized cobblestones are distributed throughout the soil profile and on the surface. Soil textural analysis indicates a sandy clay loam with a neutral soil reaction (pH 7.2). Effective rooting depth is almost 13 inches. Soil temperature averaged about 50° F at 14 inches in depth in 1997. Vegetation and litter cover are adequate to prevent serious erosion. Percent bare soil accounts for only 2% of the basic ground cover in 1997 and 2002.

The dominant overstory is a mixed population of basin big sagebrush and mountain big sagebrush, with the latter being the most prevalent. In 1983 and 1989, all sagebrush was classified as mountain big sagebrush. In 1997 and 2002, sagebrush were split into the two subspecies based upon morphological characteristics and reported separately in the data tables. The level of hedging between individual shrubs varies greatly. Mountain big sagebrush are not as large as the basin big sagebrush, measuring 26 inches in height compared to 59 inches for basin big sagebrush. The new methodology used to estimate density in 1997 shows a reduced combined density of 1,320 plants/acre compared to 4,732 estimated in 1989. Mountain big sagebrush showed mostly moderate hedging in 1997 with all plants displaying good vigor. It showed fairly good biotic potential in 1997 with several seedlings and young plants being sampled. Mountain big sagebrush was moderately to heavily hedged in 2002 and showed the effects of drought. The number of decadent plants increased from 7% to 47%. Thirty-one percent of the decadent plants sampled were classified as dying (>50% crown death). However, recruitment is good with adequate young to maintain the population. Annual leader growth averaged 2.4 inches in 2002.

Basin big sagebrush showed little utilization with a slightly higher rate of decadency than mountain big sagebrush in 1997. This would be expected with the moderately shallow soils on the site as this is a species that requires deeper soils to tolerate drought. All basin big sagebrush sampled in 2002 were decadent and 89% were classified as dying. Invader and increaser shrubs are also prominent. The past disturbance associated with power line construction and grazing has resulted in substantial populations of broom snakeweed and rubber rabbitbrush. The white rubber rabbitbrush showed moderate utilization in 1997 and 2002 with a population density of around 1,000 plants/acre. Broom snakeweed density was estimated at 3,840 plants/acre in 1997 increasing to 4,620 in 2002. Other browse include fourwing saltbush, prickly pear cactus, and stickyleaf low rabbitbrush.

Grass composition is diverse and abundant but consisted chiefly of cheatgrass and bulbous bluegrass in 1997. Together they provided 72% of the grass cover. Drought conditions in 2001 and 2002 have caused cheatgrass to decline significantly in nested frequency. Cheatgrass cover also dropped from 8% in 1997 to less than 1% in 2002. Bulbous bluegrass, while scarcely present in 1983, significantly increased in nested frequency in 1997 and 2002 and now provides the bulk of the grass cover. Some seeded grasses remain in the community

and include intermediate wheatgrass and crested wheatgrass. Seeded grasses occur primarily around power poles which were seeded after construction. The nested frequency of bluebunch wheatgrass has slowly increased over all years, however it is not very abundant contributing to only 7% of the grass cover in 2002. Sand dropseed nested frequency has remained relatively stable over all years. Other perennial grasses include bottlebrush squirreltail, Indian ricegrass, Kentucky and Sandberg bluegrass, and an occasional patch of Great Basin wildrye.

Forb composition is diverse and moderately abundant. It has changed little through the years and contains several weedy species including stickseed, pale alyssum, storksbill, Louisiana sage, and white top. Forage value and productivity of the forb component is poor even though it provided 31% of the herbaceous cover in 1997 and 21% in 2002.

1983 APPARENT TREND ASSESSMENT

Soil condition is good with little exposed bare ground. The extremely rocky and permeable nature of this soil, along with improving vegetation cover, limits erosion. Deposition of rocks and soil particles from the upper slopes probably exceeds the erosion rate. The most obvious vegetative trend is an apparent thickening stand of sagebrush which may become increasingly dominated by basin big sagebrush. Differential grazing pressure is allowing it to reproduce faster than mountain big sagebrush. Other shrub species are present but increasing at a slower rate than basin big sagebrush. Grass and forb cover as well as composition are fair to poor and relatively stable.

1989 TREND ASSESSMENT

Although extremely rocky and subject to alluvial deposition, the soil on the site has a stable trend. Due to the amount of combined cover (28% rock and pavement cover), there is little bare soil and the overall ground cover is almost unchanged since 1983. Sagebrush shows good recruitment and the age class structure indicates an expanding population. Use of sagebrush is mostly light while vigor is good. Conversely, density of the invasive broom snakeweed has increased from about 3,000 plants/acre to nearly 5,000 plants/acre. Trend for browse is considered up slightly. The forbs provide a fairly diverse understory and valuable spring forage for big game. The herbaceous trend appears stable.

TREND ASSESSMENT
soil - stable (3)
browse - up slightly (4)
herbaceous understory - stable (3)

1997 TREND ASSESSMENT

Percent bare soil has declined steadily since 1983 to less than 2%. At the same time, rock and pavement cover are declining. Vegetation and litter cover are abundant and will prevent serious erosion. Trend for soil is considered up slightly. Browse trend is stable. Density appears to be lower than reported in the past, but this is a more accurate estimate of the population with a much larger sample size being used. In addition, the relatively small number of dead plants cannot explain the decline. Mountain big sagebrush is more highly preferred than basin big sagebrush, therefore it exhibits more utilization. Broom snakeweed and white rubber rabbitbrush have the highest densities at this time. Herbaceous understory trend is up. Sum nested frequency for grasses has nearly doubled since 1989, with a significant increase in bulbous bluegrass and intermediate wheatgrass. Forb composition is unchanged.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable (3)
herbaceous understory - up but poor composition (5)

2002 TREND ASSESSMENT

Trend for soil continues to be stable. There is abundant protective ground cover and there is little bare soil. Trend for basin big sagebrush is down with all individuals sampled in 2002 classified as decadent. This is obviously a marginal site for basin big sagebrush. Mountain big sagebrush has increased slightly in density but it is also showing the effects of drought. Utilization remains moderate to heavy, and the number of decadent plants has increased from 7% to 47% of the population. About 31% of the decadent plants sampled were classified as dying (>50% crown death). However, young recruitment is good and appears adequate to maintain the current population. Other shrubs on the site are also showing increased decadence including fourwing saltbush, white-stemmed rubber rabbitbrush, stickyleaf low rabbitbrush, and broom snakeweed. Trend for the key browse species, mountain big sagebrush, is considered stable. A return to normal precipitation patterns will do much to improve the vigor of sagebrush on this site. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses has increased slightly while nested frequency of perennial forbs has decreased. However, the herbaceous understory is dominated by bulbous bluegrass which increased significantly since 1997. It currently provides 71% of the total grass cover or 56% of the herbaceous cover. Drought conditions did cause a significant decline in the frequency and cover of cheatgrass.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - stable but poor composition (3)

HERBACEOUS TRENDS --
Herd unit 17 , Study no: 40

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron cristatum	a27	b50	ab26	ab35	12	20	9	12	2.00	1.41
G	Agropyron intermedium	a-	a-	b36	b50	-	-	11	16	2.80	3.67
G	Agropyron spicatum	a18	a21	ab35	b36	6	9	13	15	1.68	2.25
G	Bromus japonicus (a)	-	-	-	6	-	-	-	3	-	.04
G	Bromus tectorum (a)	-	-	b285	a96	-	-	86	37	7.91	.67
G	Festuca spp.	-	-	12	-	-	-	4	-	.02	-
G	Oryzopsis hymenoides	-	3	-	-	-	1	-	-	-	-
G	Poa bulbosa	a6	a16	b229	c306	2	8	66	90	14.18	23.46
G	Poa pratensis	a1	a2	ab16	b21	1	1	7	8	.25	.11
G	Poa secunda	a1	b40	a6	b35	1	16	2	13	.01	.39
G	Sitanion hystrix	3	8	-	3	2	3	-	1	-	.15
G	Sporobolus cryptandrus	76	91	67	81	32	36	29	35	1.89	.87
Total for Annual Grasses		0	0	285	102	0	0	86	40	7.91	0.71
Total for Perennial Grasses		132	231	427	567	56	94	141	190	22.87	32.32
Total for Grasses		132	231	712	669	56	94	227	230	30.79	33.04
F	Alyssum alyssoides (a)	-	-	b69	a-	-	-	29	-	.22	-
F	Allium spp.	a-	a-	b11	a-	-	-	6	-	.03	-
F	Arabis spp.	-	1	-	2	-	1	-	1	-	.00

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Artemisia dracunculus	7	5	3	4	4	2	1	2	.00	.01
F	Artemisia ludoviciana	$_{a}$101	$_{b}$140	$_{a}$86	$_{a}$76	39	55	38	31	2.83	2.37
F	Aster spp.	-	8	-	-	-	2	-	-	-	-
F	Astragalus spp.	-	-	4	-	-	-	2	-	.01	-
F	Astragalus utahensis	4	6	3	-	1	3	1	-	.15	-
F	Cardaria draba	$_{a}$-	$_{a}$-	$_{b}$24	$_{b}$31	-	-	7	10	2.36	1.01
F	Castilleja linariaefolia	-	-	1	1	-	-	1	1	.03	.00
F	Calochortus nuttallii	$_{ab}$10	$_{a}$1	$_{b}$18	$_{a}$1	6	1	9	1	.06	.00
F	Cirsium spp.	14	26	10	15	7	12	5	6	.46	.50
F	Cymopterus spp.	-	-	2	2	-	-	1	2	.00	.01
F	Cynoglossum officinale	-	-	1	-	-	-	1	-	.15	-
F	Draba spp. (a)	-	-	2	-	-	-	1	-	.00	-
F	Epilobium brachycarpum (a)	-	-	1	-	-	-	1	-	.00	-
F	Erodium cicutarium (a)	-	-	$_{b}$64	$_{a}$7	-	-	24	3	.63	.04
F	Erigeron divergens	$_{a}$-	$_{a}$-	$_{b}$16	$_{a}$2	-	-	7	2	.37	.01
F	Eriogonum racemosum	3	5	2	3	3	3	1	3	.03	.04
F	Hackelia patens	$_{a}$20	$_{b}$51	$_{c}$105	$_{ab}$44	9	27	49	23	2.51	.77
F	Helianthus annuus (a)	$_{a}$-	$_{b}$26	$_{a}$2	$_{a}$1	-	16	1	1	.00	.00
F	Lactuca pulchella	$_{c}$50	$_{ab}$8	$_{b}$20	$_{a}$-	-	4	9	-	.07	-
F	Lithospermum ruderale	-	4	-	-	-	3	-	-	.03	.03
F	Medicago sativa	-	-	2	5	-	-	1	2	.45	.79
F	Oenothera spp.	-	-	-	-	-	-	-	-	.00	-
F	Phlox longifolia	$_{a}$-	$_{b}$15	$_{ab}$9	$_{b}$8	-	9	4	5	.02	.02
F	Polygonum douglasii (a)	-	-	9	-	-	-	3	-	.01	-
F	Ranunculus testiculatus (a)	-	-	5	3	-	-	2	1	.03	.00
F	Sisymbrium altissimum (a)	-	-	3	-	-	-	1	-	.03	-
F	Solidago spp.	$_{b}$16	$_{a}$-	$_{a}$-	$_{a}$-	5	-	-	-	-	-
F	Sphaeralcea coccinea	$_{a}$44	$_{a}$69	$_{b}$106	$_{b}$109	19	30	41	42	3.06	2.75
F	Tragopogon dubius	$_{ab}$68	$_{b}$1	$_{c}$40	$_{b}$3	38	1	18	2	.36	.15
F	Vicia americana	-	-	-	1	-	-	-	1	-	.00
F	Zigadenus paniculatus	1	-	-	-	1	-	-	-	-	-
Total for Annual Forbs		0	26	155	11	0	16	62	5	0.95	0.04
Total for Perennial Forbs		338	340	463	307	156	153	202	134	13.04	8.50
Total for Forbs		338	366	618	318	156	169	264	139	14.00	8.55

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 17 , Study no: 40

Type	Species	Strip Frequency '97	Strip Frequency '02	Average Cover % '97	Average Cover % '02
B	Artemisia tridentata tridentata	15	6	3.11	1.21
B	Artemisia tridentata vaseyana	25	34	4.18	7.35
B	Atriplex canescens	7	6	.19	.21
B	Chrysothamnus nauseosus albicaulis	30	27	3.86	1.90
B	Chrysothamnus viscidiflorus viscidiflorus	1	2	-	-
B	Gutierrezia sarothrae	45	57	.97	1.93
B	Juniperus osteosperma	0	1	1.00	2.67
B	Opuntia spp.	6	9	.04	.06
Total for Browse		129	142	13.37	15.36

CANOPY COVER --
Herd unit 17 , Study no: 40

Species	Percent Cover '97	Percent Cover '02
Juniperus osteosperma	-	4

BASIC COVER --
Herd unit 17 , Study no: 40

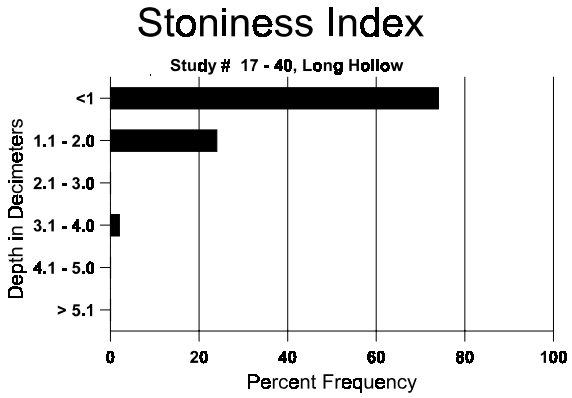
Cover Type	Nested Frequency '97	Nested Frequency '02	Average Cover % '83	Average Cover % '89	Average Cover % '97	Average Cover % '02
Vegetation	383	367	.50	7.25	48.81	57.68
Rock	259	289	25.50	24.00	17.10	17.57
Pavement	141	119	1.50	4.25	2.41	1.37
Litter	394	366	64.25	59.00	49.95	37.77
Cryptogams	150	113	1.00	1.00	3.50	2.16
Bare Ground	94	82	7.25	4.50	1.49	2.09

Key Browse Annual Leader Growth
Herd unit 17 , Study no: 40

Species	Average leader growth (in) '02
Artemisia tridentata vaseyana	2.4

SOIL ANALYSIS DATA --
Herd Unit 17, Study no: 40, Long Hollow

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
12.7	49.2 (14.3)	7.2	51.4	26.7	21.8	2.8	10.6	166.4	.7



PELLET GROUP FREQUENCY --
Herd unit 17 , Study no: 40

Type	Quadrat Frequency	
	'97	'02
Elk	63	15
Deer	32	51
Cattle	-	2

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'02	'02
305	23 (58)
1131	87 (215)
122	10 (25)

BROWSE CHARACTERISTICS --
Herd unit 17 , Study no: 40

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata tridentata																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	15	2	-	-	-	-	-	-	-	17	-	-	-	340	34	42	17
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	59	45	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	3	1	-	-	-	-	-	-	-	2	-	-	2	80			4
	02	5	4	-	-	-	-	-	-	-	1	-	-	8	180			9
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	13%	00%	09%	-61%
'02	44%	00%	89%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'83	0		0%
	'89	0		0%
	'97	460		17%
	'02	180		100%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	8	-	-	-	-	-	-	-	-	8	-	-	-	533			8
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	35	-	-	-	-	-	-	-	-	35	-	-	-	2333			35
	89	28	1	-	-	-	-	-	-	-	29	-	-	-	1933			29
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	02	3	1	4	-	-	-	-	-	-	8	-	-	-	160			8
M	83	18	8	-	-	-	-	-	-	-	26	-	-	-	1733	26	15	26
	89	27	-	-	2	-	-	-	-	-	27	-	2	-	1933	23	18	29
	97	13	24	-	-	-	-	-	-	-	37	-	-	-	740	26	42	37
	02	14	5	5	1	-	-	-	-	-	25	-	-	-	500	26	35	25
D	83	2	3	3	-	-	-	-	-	-	8	-	-	-	533			8
	89	8	3	2	-	-	-	-	-	-	11	2	-	-	866			13
	97	1	2	-	-	-	-	-	-	-	3	-	-	-	60			3
	02	13	15	1	-	-	-	-	-	-	20	-	-	9	580			29
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	260			13

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	16%	04%	00%	+ 3%
'89	06%	03%	03%	-81%
'97	59%	00%	00%	+29%
'02	34%	16%	15%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	4599	Dec:	12%
'89	4732		18%
'97	880		7%
'02	1240		47%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Atriplex canescens																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	9	-	-	-	-	-	-	9	-	-	-	180	31	33	9
	02	7	-	-	-	-	-	-	-	-	-	-	-	-	140	18	22	7
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	1	1	-	3	-	2	-	-	4	-	-	3	140			7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	90%	00%	+29%
'02	29%	07%	21%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	0%
	'89	0		0%
	'97	200		0%
	'02	280		50%

Chrysothamnus nauseosus albicaulis																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	02	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	83	10	-	-	-	-	-	-	-	-	10	-	-	-	666	25	21	10
	89	6	-	-	-	-	-	-	-	-	6	-	-	-	400	27	31	6
	97	17	18	5	-	1	-	-	-	-	40	-	1	-	820	34	35	41
	02	10	6	-	-	-	-	-	-	-	16	-	-	-	320	19	22	16
D	83	13	-	-	-	-	-	-	-	-	13	-	-	-	866			13
	89	8	1	-	-	-	-	-	-	-	8	-	1	-	600			9
	97	2	-	4	-	-	-	-	-	1	2	-	-	5	140			7
	02	11	11	1	2	-	-	-	-	-	10	-	-	15	500			25
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	-35%
'89	07%	00%	07%	+ 6%
'97	36%	19%	11%	-15%
'02	38%	02%	33%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	1532	Dec:	57%
	'89	1000		60%
	'97	1060		13%
	'02	900		56%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
M	83	3	-	-	-	-	-	-	-	-	3	-	-	-	200	20	26	3
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	200	13	14	3
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	14	19	1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	14	17	1
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	3	-	-	-	-	-	-	-	-	2	-	1	-	200			3
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+50%
'89	00%	00%	17%	-95%
'97	00%	00%	00%	+50%
'02	00%	00%	50%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	200	Dec:		0%
'89	400			50%
'97	20			0%
'02	40			50%

Gutierrezia sarothrae																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	10	-	-	-	-	-	-	-	-	10	-	-	-	200			10
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	89	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	97	104	-	-	-	-	-	-	-	-	104	-	-	-	2080			104
	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	83	44	-	-	-	-	-	-	-	-	44	-	-	-	2933	13	9	44
	89	67	-	-	-	-	-	-	-	-	67	-	-	-	4466	13	13	67
	97	82	-	-	-	-	-	-	-	-	82	-	-	-	1640	11	10	82
	02	184	-	-	2	-	-	-	-	-	180	6	-	-	3720	8	9	186
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	97	6	-	-	-	-	-	-	-	-	5	-	-	1	120			6
	02	40	-	-	-	-	-	-	-	-	28	-	-	12	800			40
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	520			26

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+40%
'89	00%	00%	00%	-23%
'97	00%	00%	.52%	+17%
'02	00%	00%	05%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	2999	Dec:	0%
'89	4999		3%
'97	3840		3%
'02	4620		17%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	1	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	50%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	0		-
	'02	40		-

Opuntia spp.																		
Y	83	4	-	-	-	-	-	-	-	-	2	-	2	-	266			4
	89	8	-	-	-	-	-	-	-	-	8	-	-	-	533			8
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	7	-	-	-	-	-	-	-	-	5	-	2	-	466	6	10	7
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	7	-	-	-	-	-	-	-	-	7	-	-	-	140	7	10	7
	02	10	-	-	1	-	-	-	-	-	11	-	-	-	220	5	14	11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	36%	-27%
'89	00%	00%	00%	-66%
'97	00%	00%	00%	+25%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	732	Dec:	-
	'89	533		-
	'97	180		-
	'02	240		-